

AMENDMENTS TO THE CLAIMS

1. (Currently amended) An injection device comprising: a housing, a nozzle assembly removably associated with the housing and defining a fluid chamber, a plunger; a trigger assembly, an energy generating source operatively associated with the trigger assembly so that movement of the trigger assembly activates the energy source to move the plunger in a first direction and expel a fluid from the fluid chamber, and a fixed injection-assisting probe at a distal end of the injection device, said injection-assisting probe comprising:

a body fixed to a distal end of the nozzle assembly; and

a discharge channel extending through the probe body, in fluid communication at a first end with the fluid chamber, and terminating at a second end in an orifice through which the fluid is expelled;

wherein the energy source and discharge channel are configured to expel the fluid through the orifice to jet inject the fluid, and the discharge channel has a length to orifice diameter is ratio greater than 6/1.

2. (Canceled)

3. (Currently amended) The injection device of claim 1, wherein the discharge channel length to orifice diameter ratio is at least 9/1.

4. (Original) The injection device of claim 1, wherein the orifice diameter is between 0.004 to 0.012 inches.

5. (Original) The injection device of claim 1, wherein a discharge channel length is at least 0.024 inches

6. (Withdrawn) The injection device of claim 1, wherein the discharge channel is provided in the form of a metal tube which is associated with the probe body.

7. (Canceled)

8. (Withdrawn) The injection device of claim 6 wherein the probe body includes a flexible membrane and the metal tube passes through the membrane.

9. (Withdrawn) The injection device of claim 8 wherein the membrane is sufficiently recessed within the probe body that the metal tube does not protrude out of the body until fluid is being expelled from the fluid chamber.

10. (Canceled)

11. (Withdrawn and currently amended) The injection device of claim 10, wherein the ~~two~~ nozzle assembly comprises two sections that are joined by ultrasonic bonding ~~means~~, screwing ~~means~~, friction fitting ~~means~~, adhesive bonding ~~means~~, or snapping ~~attaching means~~.

12. (Withdrawn and currently amended) The injection device of claim 11 wherein one section of the nozzle assembly includes the probe and the other includes a metal tube which is joined to the probe body by a snapping attachment ~~means~~ comprising at least one protrusion on a wall of the metal tube and at least one corresponding recess on a wall of the probe body, with the metal tube including the discharge channel.

13. (Withdrawn) The injection device of claim 12 wherein the metal tube receives the probe body therein.

14. (Canceled)

15. (Canceled)

16. (Currently amended) An injection device comprising:
a housing, a plunger assembly;
a trigger assembly;
an energy generating source operatively associated with the trigger assembly
so that movement of the trigger assembly activates the energy source to move the plunger in a first direction;
and

a nozzle assembly comprising:
a fluid chamber for holding fluid; and
a nozzle discharge channel in fluid communication with ~~an end of the~~
fluid chamber and ~~having ending at~~ an orifice through which fluid is expelled when the
plunger is moved in the first direction;
wherein the channel has a length, and the channel and orifice have a diameter,
such that the discharge channel has a length to orifice diameter ratio of greater than 6/1;
~~wherein, and~~ the energy source and discharge channel are configured to expel the fluid to jet
inject the fluid.

17. (Original) The injection device of claim 16, wherein the orifice diameter is between 0.004 to 0.012 inches and the discharge channel has a length of at least 0.024 inches.

18. (Currently amended) The injection device of claim 16, wherein the discharge channel has a length to orifice diameter ratio is between 9/1 and 20/1.

19. (Currently amended) The injection device of claim 1, wherein the discharge channel has a length to orifice diameter ratio is between 9/1 and 20/1.

20. (New) A needleless jet injection device comprising:
a housing, a plunger assembly;
a trigger assembly;
an energy source operatively associated with the trigger assembly so that
movement of the trigger assembly activates the energy source to move the plunger in a first
direction;
a fluid chamber for holding fluid; and
a nozzle including a a nozzle discharge channel in fluid communication with
the fluid chamber and ending at an orifice through which fluid is expelled when the plunger is
moved in the first direction;
wherein the channel has a length and a diameter, with an average length to
diameter ratio adjacent the orifice of greater than 6/1, such that the energy source has a
reduced force generation requirement to expel the fluid to jet inject the fluid.

21. (New) The injection device of claim 20, wherein the orifice has a diameter that is substantially equal to the channel diameter adjacent thereto.

22. (New) The injection device of claim 21, wherein the channel has a constant diameter where the length to diameter ratio is measured.

23. (New) The injection device of claim 20, wherein the discharge channel has a length to diameter ratio between 9/1 and 20/1.

24. (New) The injection device of claim 20, wherein the energy source and discharge channel are configured to generate substantially steady state pressures of less than 4000 p.s.i.

25. (New) The injection device of claim 24, wherein the energy source produces up to around 40 lbs to inject the fluid.